16. (new) A method for transmitting a data stream in a frame belonging to at least one terminal equipment type, comprising the steps of:

synchronously inserting data of individual terminal equipment types into said frame in a first unit;

synchronously transmitting said data with a transfer rate formed dependent on a frame length and number of bits arranged in the frame to a second unit with a time-division multiplex method; and

dividing said data stream to terminal devices of at least one terminal equipment type in said second unit.

REMARKS

Claims 1-15 are pending in the application. These claims were rejected as follows:

Claims / Section	35 U.S.C. Sec.	References / Notes
15	Objection	• Failure to further limit the subject matter of a previous claim
1, 3, 14	§112, Second Paragraph Indefiniteness	• Lack of antecedent basis
1-8, 14 & 15	§102(e) Anticipation	• Bartholomew, et al. (U.S. Patent No. 6,400,708).
9-11	§103(a) Obviousness	• Bartholomew, et al. (U.S. Patent No. 6,400,708); and • Tzannes, et al. (U.S. Patent No. 6,522,666).
12, 13	§103(a) Obviousness	• Bartholomew, et al. (U.S. Patent No. 6,400,708).

Applicants have amended claims 1, 4 and 14, and have also provided discussion for distinguishing the present invention, with claims as amended, from the art cited against it. Applicants have replaced claim 15 with claim 16.

Applicants' use of reference characters below is for illustrative purposes only and is not intended to be limiting in nature unless explicitly indicated.

OBJECTION TO CLAIM 15

1. Claim 16 has been added to replace claim 15 and to more clearly distinguish the limitations from claim 4.

Applicants request clarification in the event this objection to newly added claim 16 is maintained in a later Office Action.

35 U.S.C. §112, SECOND PARAGRAPH, INDEFINITENESS OF CLAIMS 1, 3 AND 14

2. Applicants have amended claims 1 and 14 to correct the antecedent issues raised by the Examiner.

Language in claims 1 and 14 has been corrected to reflect a proper antecedent basis. Applicants thank the Examiner for bringing this to their attention.

35 U.S.C. §102(e), CLAIMS 1-8, 14 AND 15 ANTICIPATION BY BARTHOLOMEW

3. Bartholomew fails to teach each and every element of the independent claims, as amended, in that it only discloses a fixed data transfer rate between a subscriber and a central office and not the variable data transfer rate as added by the amendments.

The subject matter of the invention, with claims as amended, concerns providing a variable number of multiple services (POTS, ISDN services and broadband) over a 2-wire subscriber connection line in an SDSL frame structure which is conveyed to the central office in which a transfer rate is based on the frame length and number of bits arranged in the frame.

Bartholomew describes a method to use the IDSL B-channels (64 kbits/s) for data services while the D-channels (16 kbits/s) transport compressed voice and signaling data. In this way the ISDN format is used in a different way to transmit compressed voice and data services. D-channels and B-channels are multiplexed and demultiplexed in a channel bank into a T1 link. It discloses use of the D channel of an ISDN service of a 2-wire subscriber connection line for an additional POTS service (compressed voice), and an accommodation of a plurality (up to 4) D channels (16 kbps) **of a plurality of 2-wire subscriber connection lines** in a 64 kb/s time slot on a downstream synchronous transmission path in a **T1 frame structure** which is conveyed to the central office. Bartholomew only discloses a fixed data transfer rate.

In contrast to Bartholomew, the subject matter of the invention refers to the common accommodation of services (POTS, ISDN and broadband). The data from end devices (useful and monitoring data), meaning all data, **are completely provided in transparent form of the line termination side**. For example, for ISDN BRA, this comprises the B, D and EOC channels. The services are thereby not impaired, thus retain complete functionality and therewith represent the basis for a provision of multiple services.

Bartholomew refers only to the embedding of D channels in DS0 time slots (64 kb/s) on D channels with compressed speech of a POTS service. In the shown case of IDSL (D and EOC channels are superfluous due to leased-line use), the D channel is misused for a compressed analog connection and the EOC channel is ignored, thus not transmitted over the T1 interface. An ETSI

corresponding to an ISDN BRA is therewith no longer behind the subscriber-side multiplexer (channel bank 35 = LT portion). The functionality of the EOC channel is no longer present on the LT side and can, for example, no longer be used for the insertion of an ISDN service-specific test loop.

Bartholomew has in common with the present invention that voice and data services are transmitted over one link, but apart from this there is little else in common.

In Bartholomew, data is put into the ISDN voice channel and compressed voice is put into the ISDN signaling channel. Bartholomew' system does not and can not transmit ISDN service. In the present invention, one or multiple ISDN services can be transmitted over the S(H)DSL link. One ISDN link comprises two voice channels (64 kbits/s B-channels), ISDN signaling for higher layers (16 kbits/s D-channels) and ISDN activation/deactivation and control signaling (EOC messages). ISDN can be transmitted transparently over the SDSL link.

Bartholomew describes a concentrating channel bank. In the present invention, voice and data services are transmitted from the subscriber to the network node (not-concentrating).

As background relating to SDSL and SHDSL standards, ITU-T SHDSL and ETSI SDSL were both approved in their respective working groups in February 2001. The final ITU-T SHDSL standard text (G.991.2) was drafted in April 2001. The ETSI SDSL standard (TS 101 524) was publicized in June 2001.

Regarding symmetric DSLs, the term "SDSL" is used in Europe and in North America in different ways. In Europe, SDSL (Symmetrical single pair high

bitrate Digital Subscriber Line) refers to a technology standardized by ETSI in 2001 (ETSI TS 101 524). ITU-T's SHDSL (Single-pair High-speed Digital Subscriber Line) standard G.991.2 (2001) which is nearly identical to ETSI's SDSL standard also applies to North America.

The term SHDSL is used in North America and by ITU-T since the name "SDSL" was already used by a proprietary product.

Apart from the name and the fact that they both transmit symmetric data rates using DSL technology, there are big differences between proprietary SDSL and S(H)DSL: Proprietary SDSL is an extension of HDSL using 2B1Q line code and data rates of 2304 kbits/s and fractions thereof. S(H)DSL uses the TC-PAM line code and allows data rates from 198 kbits/s up to 2312 kbits/s in increments of 8 kbits/s.

Proprietary SDSL, like HDSL, is plesiochronous: clock rates at the central office and at the remote side are not synchronized. Clocking differences are compensated with variable frame lengths.

Standardized S(H)DSL has a plesiochronous and a synchronous mode. In synchronous mode the clock at the remote side is slaved to the central office clock.

ISDN transmission over S(H)DSL, as described in the present application, requires synchronous transmission. It would not work with plesiochronous frames, as disclosed by Bartholomew.

With respect to S(H)DSL Framing, the S(H)DSL frame, standardized in 2001, offers a great degree of flexibility compared to frames of earlier symmetric

DSL standards: the frame allows synchronous as well as plesiochronous data transmission. In synchronous mode the S(H)DSL frames have equal length. In plesiochronous mode addition or removal of special bits at the end of the frame compensates for the clock differences. ISDN transmission requires synchronous framing.

A great novelty of the S(H)DSL frame was, that it could be configured or the transmission of data rates from 198 kbits/s to 2312 kbits/s in increments of 8 kbits/s. This became possible due to new synchronization schemes. The frame and its supported rate are adapted to the data rate requirements of the service.

Figure 4 of the present application shows this S(H)DSL framing and a mapping of the ISDN link into the S(H)DSL frame. When the present application was filed, there was no agreement as to the use of the 8 kbits/s granularity.

Earlier symmetric DSLs like HDSL, HDSL2 or IDSL could only run at one data rate (e.g. T1) or an integer fraction thereof (1/2, %). The service was adapted to the given data rate of the DSL link. (See Bartholomew et al -There the T1 link is filled up with 64 kbits/s B-channels and 16 kbits/s 0-channels).

With regard to multiplexing, the different subscriber connection influences the supported services. As a transfer medium, in the subject matter of the invention, the SDSL frame structure is used which, via insertion of the 8 kb/s channels, **offers a flexibility that** offers **the embedding of the channels to be transmitted**. This form of multiplexing is based on a configurable frame structure negotiated upon startup on 8 kb/s channel units. A 64 kb/s channel

(i.e., B channel) is thereby only an application which represents an aggregation of 8 such channels. A D-channel uses 2 Z channels.

Bartholomew refers only to that D channels of up to 4 subscribers in a DS0 time slot of a T1 connection can be combined, meaning the granularity forming the basis is 64 kb/s.

Finally, with respect to the EOC channel, the Examiner has mischaracterized the meaning of the EOC channel. The EOC channel designated in claim 5 is a component of the SDSL frame (a counterpart would be a T1 channel for operational purposes to operate the T1 transmission line). This SDSL EOC comprises the monitoring data for the SDSL transmission line. In the case of an embedded ISDN service (directed at connected ISDN subscribers), EOC channel data are accommodated in this SDSL EOC channel (claim 5) since, as already mentioned, the services are transparently transferred. To differentiate between the individual services, the service-specific EOC channel data are characterized in the SDSL EOC channel (claim 11).

Bartholomew does in fact refer to the existence of the ISDN EOC channel, since the multiplexer is connected to an ISDN BRI line where there is (according to the definition) an ISDN EOC channel. However, this is terminated in the case of IDSL, since it is not used. In a normal ISDN connection, this is conveyed over a DS0 time slot. However, the EOC channel is not mapped in a T1 channel for operational purposes.

For these reasons, Applicants assert that the amended claim language clearly serves to distinguish over Bartholomew and respectfully requests that the 35 U.S.C. §102 rejection be withdrawn from the present application.

35 U.S.C. §103(a), CLAIMS 9-11 OBVIOUSNESS OVER BARTHOLOMEW IN VIEW OF TZANNES

4. Tzannes is not a proper 102(e) reference because its 35 U.S.C. §371(c) date is after the filing date of the present application, therefore, it cannot be combined with Bartholomew as an obviating reference.

The Examiner states, with respect to claim 9, that Bartholomew fails to disclose providing bits for operational control in data belonging to a terminal equipment type and arranging bits outside of a payload data region provided for the terminal equipment, but then provides Tzannes as a reference disclosing this element.

According to MPEP §2136.03(II)(C), for PCT applications filed prior to November 29, 2000, a reference may be used as a 35 U.S.C. §102(e) reference only upon completion of the requirements of 35 U.S.C. §371(c)(1), (2) and (4). Tzannes lists on its face a 371 completion date of September 12, 2000, which is well after the priority date of October 29, 1999 of the present application (priority perfected based on the February 9, 2001 submission of a certified copy of the priority application.

Therefore, without addressing the technical merits, Applicants assert that Tzannes cannot serve as a prior art reference to the present application.

35 U.S.C. §103(a), CLAIMS 12 AND 13 OBVIOUSNESS OVER BARTHOLOMEW

5. It was not obvious at the application filing time to utilize S(H)DSL frames which allow the mapping of ISDN links.

In the OA, the Examiner takes official notice that symmetric digital subscriber line framing is a standard well known in the art, stating that it would have been obvious to an ordinary person of skill in the art, at the time the invention was made, to implement the method of Bartholomew of ISDN connections using the well known SDSL (Symmetric Digital Subscriber Line) framing technology so that a high rate ISDN DSL (Integrated Services Digital Network Digital Subscriber Line) (IDSL) can be implemented over a single copper line. However, at the point in time of the invention S(H)DSL framing was not standardized (see notes above). S(H)DSL frames which allow the mapping of ISDN links have not even been under discussion at that point of time.

Furthermore, Bartholomew's system does not and can not transmit ISDN service. IDSL is a physical layer DSL based on the ISDN physical layer. The present invention does not offer IDSL but transmits via ISDN or other voice service together with data services over S(H)DSL.

For these reasons, the Applicant asserts that the amended claim language clearly distinguishes over the prior art, and respectfully request that the Examiner withdraw the §103(a) rejection from the present application.

CONCLUSION

Inasmuch as each of the objections have been overcome by the amendments, and all of the Examiner's suggestions and requirements have been

satisfied, it is respectfully requested that the present application be reconsidered, the rejections be withdrawn and that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

Mark Bergner (Reg. No. 45,877)

Mark Bergner
SCHIFF HARDIN, LLP
PATENT DEPARTMENT
6600 Sears Tower
Chicago, Illinois 60606-6473
(312) 258-5779
Attorney for Applicants
Customer Number 26574

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Mark Bergner Attorney for Applicants